ALO--WWID-WIPP-1999-0002 Final Report

Occurrence Report

Waste Isolation Pilot Plant

(Name of Facility)

Nuclear Waste Operations/Disposal

(Facility Function)

Carlsbad Area Office Westinghouse Waste Isolation Div.

(Laboratory, Site, or Organization)

Name: xxxxxxxxxx
Title: Facility Manager Designee **Telephone No.:** (505) xxxxxxx

(Facility Manager/Designee)

Name: xxxxxxxxxx
Title: SURFACE OPERATIONS MANAGEMENT ASST. **Telephone No.:** (505) xxxxxxx

(Originator/Transmitter)

Name: **Date:**

(Authorized Classifier (AC))

1. Occurrence Report Number: ALO--WWID-WIPP-1999-0002

NEAR MISS TO SIGNIFICANT PERSONNEL INJURY

2. Report Type and Date: Final

	Date	Time
Notification:	02/12/1999	10:17 (MTZ)
Initial Update:	03/10/1999	10:50 (MTZ)
Latest Update:	03/10/1999	10:50 (MTZ)
Final:	04/26/1999	07:25 (MTZ)

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: Waste Isolation Pilot Plant

6. Secretarial Office: EM - Environmental Management

7. System, Bldg., or Equipment: Underground (Mine)

8. UCNI?: No

9. Plant Area: N-300 Drift

10. Date and Time Discovered: 02/08/1999 10:00 (MTZ)

11. Date and Time Categorized: 02/08/1999 12:00 (MTZ)

12. DOE Notification:

Date	Time	Person Notified	Organization
02/08/1999	10:40 (MTZ)	xxxxxxxxxx	DOE-CAO

13. Other Notifications:

14. Subject or Title of Occurrence:

NEAR MISS TO SIGNIFICANT PERSONNEL INJURY

15. Nature of Occurrence:

10) Cross-Category Items
B. Near Miss Occurrences

16. Description of Occurrence:

At approximately 1000 on Monday, February 8, 1999, an employee was struck on the shoulder by de-energized power and data cables falling from the roof of the WIPP underground. The employee was part of a three man crew engaged in temporarily relocating the suspended cables by transferring them from a permanent cable hanger system to a set of temporary hangers. One of the temporary hangers failed, transferring the load to the second hanger, which also failed. Subsequent cable hangers continued to fail sequentially until approximately 200 lineal feet of temporarily suspended cable had fallen to the floor. The suspended cable bundle is estimated to weigh approximately 15-20 pounds per lineal foot.

The injured employee was treated by Site medical personnel and then transferred to the Carlsbad Medical Center for x-rays and further examination. The injuries did not require in-patient hospitalization. The employee returned to work on Tuesday, February 9, without a lost work day. The other two employees in the work area were not injured.

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17. Operating Conditions of Facility at Time of Occurrence:

Normal Operations

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18. Activity Category:

03 - Normal Operations

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19. Immediate Actions Taken and Results:

After immediate attention to the injured employee, work was suspended and the area was isolated. An investigation team inspected the work area, took pictures, and obtained samples of the failed temporary suspension devices. A root cause investigation team was appointed to conduct an in-depth analysis of the event.

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20. Direct Cause:

1) Equipment/Material Problem
B. Defective or Failed Material

21. Contributing Cause(s):

4) Design Problem
C. Error in Equipment or Material Selection

22. Root Cause:

6) Management Problem
B. Work Organization/Planning Deficiency

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23. Description of Cause:

When used in a permanent cable installation, commercially available wire hanger clips are used at four foot intervals to

suspend the power cables from a steel messenger cable. This messenger cable is bolted into the mine overhead at twenty foot intervals. This cable support system is installed in accordance with an approved engineering drawing. The method is commonly used through the mining industry.

As the workers moved the cable bundle, they used the same wire hanger clips to suspend the cables from available roof bolt plates which were already in place as part of the ground control system. In attaching the hanger clips to available roof bolt plates, the hangers were necessarily placed at five to ten foot intervals. Further, when the clips are used with the permanent suspension system, the hooks on both ends of the clip are placed over the messenger cable. When the clips are attached to roof bolt plates, the small hole in the plate allows only one hook to be attached. The hook on the other end of the clip is "latched back" over the clip itself. This method effectively halves the load carrying capacity of the wire clip.

The manufacturer provided information to the investigative team which shows a rated load capacity of 110 pounds with both hooks on a messenger cable, but only 60 pounds when in the "latched back" configuration with one hook used to suspend the load.

This task was not adequately planned and briefed, and a relatively inexperienced crew was assigned to move the cable run. Only one employee on the crew had prior experience with the task. The involved cable bundle was bigger and heavier than the average in the mine. In moving the cable, fewer clips were used because of the roof bolt plate locations, and those clips were necessarily used in a "latch back" configuration which reduced their load capacity.

The combination of heavy cable, reduced clip capacity, and failure to appreciate these factors due to inexperience and inadequate briefing, all combined to initiate the event.

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24. Evaluation (by Facility Manager/Designee):

Preliminary investigation indicates the failed temporary suspension devices were most probably stressed beyond their design capacity by the weight of the suspended cable bundle. Interim recovery will include resuspension of the cables using the permanent system. It remains necessary to move the cables to accommodate ground-control work, but they will not be moved until the failure mechanism is fully understood and work can

proceed with confidence.

UPDATE WITH FINAL REPORT: The cable bundle has been returned to the permanent system. No further work involving moving cable bundles to a temporary suspension system at any location in the mine will be undertaken until completion of those corrective actions necessary to ensure safety.

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25. Is Further Evaluation Required?: No

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26. Corrective Actions

(* = Date added/revised since final report was approved.)

1. Brief all underground operations personnel on causes of the event as determined by the Root Cause Analysis Team.

Target Completion Date: 03/01/1999	**Completion Date:** 03/01/1999

2. Develop a specific job safety briefing sheet for this task. Briefing sheet will identify hazards and mitigation methods. This briefing sheet will be developed and maintained as noted in corrective action number 3.

Target Completion Date: 04/01/1999	***Completion Date:** 05/07/1999

3. Management implement a "Job Safety Analysis" notebook for routine underground tasks. Notebook to have a separate "Standards for Operational Safety" sheet for each identified task. The notebook will be used as part of a job brief when assigning personnel to those routine tasks which are frequently performed.

Target Completion Date: 12/31/1999	***Completion Date:** 10/05/1999

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27. Impact on Environment, Safety and Health:

None

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28. Programmatic Impact:

None

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29. Impact on Codes and Standards:

None

30. Lessons Learned:

Even in an environment where excellence is the standard and the practice, the inherent dangers in a routine job can be overlooked. Personnel need to be wary of developing a complacent attitude because "We've done that hundreds of times before". There is no adequate substitute for having a responsible person routinely brief each job and specifically including possible hazards in that brief.

31. Similar Occurrence Report Numbers:

1. None

32. User-defined Field #1:

33. User-defined Field #2:

34. DOE Facility Representative Input:

35. DOE Program Manager Input:

36. Approvals:

Approved by: xxxxxxxxxx, Facility Manager/Designee
Date: 03/10/1999
Telephone No.: (505) xxxxxxx

Approved by: xxxxxxxxxx, Facility Representative/Designee
Date: 04/26/1999
Telephone No.: (505) xxxxxxx

Approved by: Approval delegated to FR
Date: 04/26/1999
Telephone No.: